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CPP-627 CERCLA Removal Action Waste Management Plan



Idaho National Engineering and Environmental Laboratory

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***CPP-627 CERCLA Removal Action
Waste Management Plan***

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ABSTRACT

This Waste Management Plan describes waste management and waste minimization activities for the Comprehensive Environmental Response, Compensation and Liability Act non-time critical removal action for CPP-627 at the Idaho Nuclear Technology and Engineering Center located within the Idaho National Engineering and Environmental Laboratory. The waste management activities described in this plan support the Comprehensive Environmental Response, Compensation and Liability Act removal activity presented in the Action Memorandum for CPP-627, DOE/NE-ID-11164, and the *Removal Action Work Plan for the Decontamination and Decommissioning of Building CPP-627, the Remote Analytical Facility*, DOE/NE-ID-11158. This plan identifies the waste streams that will be generated during investigation and implementation of the removal action and details plans for waste minimization, waste management strategies, and waste disposition.

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ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
HWMA	Hazardous Waste Management Act
ICDF	INEEL CERCLA Disposal Facility
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
IW	industrial waste
LLW	low-level waste
MLLW	mixed low-level waste
PCB	polychlorinated biphenyl
PEW	Process Equipment Waste
PPE	personal protective equipment
RCRA	Resource Conservation and Recovery Act
TRU	transuranic waste
TSDf	treatment, storage, and disposal facility
WAC	Waste Acceptance Criteria
WGS	Waste Generator Services
WMP	waste management plan
WTS	waste technical specialist

CPP-627 CERCLA Removal Action Waste Management Plan

1. INTRODUCTION

This Waste Management Plan (WMP) was prepared for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) non-time critical removal action for CPP-627, the Remote Analytical Facility. This project is an Idaho Nuclear Technology and Engineering Center (INTEC) Clean/Close Project at the Idaho National Engineering and Environmental Laboratory (INEEL).

1.1 Purpose and Objectives

This WMP is intended to provide a management and planning tool for identifying and managing the waste streams generated from the implementation of the CERCLA non-time critical removal action for CPP-627. The primary objective of this WMP is to properly identify the waste types that are anticipated to be generated during the removal activities and present a strategy for managing them compliantly. This plan addresses the waste characterization strategy; requirements for waste staging or storage, labeling, packaging and transportation, and treatment, if required; and designated facilities for ultimate disposal of the waste. This plan also identifies the management of waste information and discusses strategies for minimizing waste during removal activities.

2. WASTE IDENTIFICATION

Waste streams generated as a result of the CERCLA removal action will be identified and characterized as specified in this WMP. The waste management activities will be performed in accordance with the waste management applicable or relevant and appropriate requirements identified in the Action Memorandum (DOE-ID 2004a) and discussed in the Removal Action Work Plan (DOE-ID 2004b).

In conducting the removal action, various waste streams will be identified. These waste streams will include the following:

- Industrial waste (IW)
- Low-level waste (LLW)
- Hazardous waste
- Mixed low-level waste (MLLW) (waste that is both low-level waste and hazardous waste)
- Polychlorinated biphenyl (PCB) waste
- Alpha low-level waste
- Mixed alpha low-level waste
- Transuranic waste (TRU)
- Mixed TRU.

3. GENERAL REQUIREMENTS

Waste types resulting from the CERCLA removal activities will be managed in accordance with this WMP. The following sections provide the general requirements for management of this CERCLA waste.

3.1 Waste Minimization and Segregation

Wherever possible, waste minimization strategies will be employed during implementation of the remedies. Waste minimization for this project will be accomplished through design and planning to ensure efficient operations that will not generate unnecessary waste. As part of the prejob briefing, emphasis will be placed on waste reduction philosophies and techniques, and personnel will be encouraged to continuously attempt to improve methods for minimizing waste generation. Practices to be instituted to support waste minimization include, but are not limited to, the following:

- Restricting material entering radiological buffer areas to that needed for work performance
- Substituting recyclable items for nonhazardous and easily-disposed-of items
- Reusing or recycling items when practical
- Using equipment and materials that can be easily decontaminated and will not absorb radioactivity, e.g., avoid paper and wood products
- Segregating contaminated waste from uncontaminated waste.

3.2 Waste Characterization

Waste generated during implementation of this CERCLA action will be characterized using sampling and analytical information (both existing and new) or process knowledge. Initial waste characterization based solely on process knowledge must ensure that the chemical, physical, and radiological properties of the waste are adequately determined. The designation must be accomplished with sufficient accuracy to ensure that subsequent treatment, staging/storage, or disposal of the waste is protective of human health and the environment. This information will be used to prepare a waste profile that will be reviewed and approved by the INEEL CERCLA Disposal Facility (ICDF) and/or other applicable disposal facility in accordance with respective Waste Acceptance Criteria (WAC).

Initial characterization begins with a review of historic information such as the review of old procedures, technical manuals, drawings, photographs, past radiological surveys, and interviews with personnel associated with the historical operations in CPP-627. Preliminary classifications have been made of anticipated waste types based on process knowledge and existing characterization data regarding the source(s) of the expected waste. As more information on waste streams is collected and characterization activities performed, any or all of the waste may be reclassified prior to disposal. Prior to ultimate disposal, waste may be further characterized to ensure compliance with the receiving facility's WAC. Sampling of the waste for waste profile completion purposes and/or new waste characterization purposes will be performed in accordance with the approach outlined in this project's Characterization Plan (DOE-ID 2004c).

Debris characterization may use an estimation method developed to determine the probable distribution of radionuclide and chemical contaminant concentrations on or within the debris (e.g., metal

and concrete). The contaminant thickness will be determined by visually inspecting representative portions of the debris. Using this information, a mass balance can then be calculated using an assumed or calculated density of the debris and the linear feet of debris present. Upon completion of the mass balance calculations, the waste profiles will be finalized.

3.3 Waste Management and Disposition Strategy

Basic waste management strategies are discussed below; however, if other more cost-effective methods become available that meet the applicable or relevant and appropriate requirements, they may be used. Throughout the project, material will be recycled whenever possible, assuming that it is economically feasible for the project.

In general, management and disposal of radiologically or chemically contaminated waste generated from the removal action will be at the ICDF. Note: The Staging and Storage Annex (CPP-1789), located within the INTEC fence, is included in the ICDF and may be used for staging and/or storage of waste generated by this removal activity. Facilities used for waste treatment or disposal other than the ICDF will be subject to an off-Site determination (40 CFR 300.440) by Environmental Protection Agency.

The ICDF is the preferred location for disposal of contaminated CERCLA wastes and is located within the WAG 3 area of contamination (DOE-ID 1999). As the wastes are CERCLA wastes generated within the WAG 3 area of contamination, land disposal restrictions are not applicable unless placement is triggered or treatment is performed, except as otherwise noted in this document. As necessary, wastes such as concrete and structural materials will be reduced in size during removal and containerized to meet the receiving facility's WAC.

Noncontaminated waste streams such as IW will be disposed of as IW at the INEEL Landfill Complex. Should a waste stream be encountered that does not meet the ICDF WAC for treatment or disposal, it may be managed at the ICDF pending transfer to the appropriate storage, treatment, or disposal facility. This waste will be required to meet the ICDF WAC for management. The following sections provide the strategy for management of the various waste types anticipated to be generated by this action.

Though not expected to be encountered, waste generated during the CPP-627 removal action that has uncertainties associated with waste classification (i.e., whether the waste may be high-level waste), such waste will be appropriately staged/stored until appropriate waste classification determinations are made under appropriate criteria. Though not expected to be encountered, waste generated during the CPP-627 removal action that is classified as a high-level waste (e.g., if a sample vial of calcine is found), this waste will be identified as a high-level waste and managed accordingly.

3.3.1 Industrial Waste

IW is solid waste that is neither radioactive nor hazardous. At the INEEL, IW streams are typically disposed of at the INEEL Landfill Complex. Many types of CERCLA IW are generated as a result of material used in a removal project that the generator believes has not been contaminated with either radioactive or hazardous materials. This absence of contamination is validated by radiation surveys, radiological smears and analysis, or visual inspections (visual staining and/or discoloration of soil and/or debris).

A general hazardous waste determination is prepared for routinely generated IW to document that the waste is neither radioactive nor hazardous. IW streams that have a higher probability of containing constituents restricted from disposal are considered nonroutine and will undergo a waste-stream-specific

hazardous waste determination. This determination is accomplished by sampling; performing radiation and contamination surveys; using process knowledge of the waste-generating process (e.g., determining if the waste was mixed with a listed waste or derived from the treatment, storage, or disposal of a listed waste); and evaluating the composition of the IW. The Waste Generator Services (WGS) representative evaluates CERCLA IW to determine if the waste meets the IW acceptance criteria.

IW is generally collected in IW collection dumpsters posted with signs describing acceptable and prohibited items. However, to ensure that disposal of IW is protective to human health and the environment, the INEEL Landfill Complex employs the following additional methods:

- Characterization of IW by WGS to ensure that the requirements of the WAC are met before shipment to the facility
- Prohibition of the receipt of radioactive and hazardous waste
- Prohibition of the receipt of free liquids at the landfill
- Periodic inspection of received waste to validate that it meets the acceptance and waste determination criteria
- Periodic location and sampling of groundwater monitoring wells near the INEEL Landfill Complex.

3.3.2 Low-Level Waste

LLW that meets the ICDF WAC will be disposed of at the ICDF. Waste categorized as LLW may include, but is not limited to, the building structure; metal items such as conduit and non-PEW piping; laboratory benches; glove boxes and hoods from the Decon Development Laboratory and Emission Spectroscopy Laboratory; electrical components and equipment; sampling materials; pipes and valves; oil from gearboxes and ventilation system components; personal protective equipment (PPE) and miscellaneous materials from sampling, decontamination, and removal activities; and other radiologically contaminated materials such as petroleum-contaminated media (i.e., soil or other absorbent materials containing radiological- and petroleum-contaminated materials). LLW may also be evaluated for disposal at the Radioactive Waste Management Complex or an off-Site disposal facility.

3.3.3 Hazardous Waste

Hazardous waste that may be generated includes, but is not limited to, lead solids such as bricks and blankets used for shielding; mercury switches; mercury residuals from spills; and materials that are determined to be hazardous based on process knowledge or sampling information. Where possible, materials such as mercury and lead will be recycled. These wastes are planned to be disposed of in the ICDF. In the event these wastes do not meet the ICDF WAC, the waste will be containerized, treated, and/or stored at the ICDF as necessary until appropriate on-Site or off-Site treatment, storage, or disposal is arranged.

3.3.4 Toxic Substances Control Act Waste

Streams regulated under the Toxic Substances Control Act may include, but are not limited to, PCB waste such as oil and grease removed from gearboxes, motors, heating and ventilation equipment, and blowers; materials from sampling of oils and grease; and PPE and miscellaneous materials from sampling, decontamination, and removal activities. Asbestos will be wetted and double-bagged or

double-wrapped in plastic, according to asbestos abatement protocol. Equipment found to contain PCB-regulated oils is to be marked using the M_L marking (Caution – Contains PCBs). Until this equipment is removed, the area will also be posted with “DANGER – UNAUTHORIZED PERSONNEL KEEP OUT” at the entrance to this area and along the boundary as necessary to be seen from any approach to the area, and portable fire extinguishers and spill-control equipment will be available. These wastes are planned to be disposed of in the ICDF. In the event these wastes do not meet the ICDF WAC, the waste will be containerized, treated, and/or stored at the ICDF as necessary until appropriate on-Site or off-Site treatment, storage, or disposal is arranged.

3.3.5 Mixed Low-Level Waste

Hazardous Waste Management Act (HWMA)/Resource Conservation and Recovery Act (RCRA) MLLW that may be generated includes, but is not limited to, A/B lines; glove boxes and laboratory hoods; electrical components and equipment; painted metal items such as duct work and cabinets; lead glass windows; lead bricks; sampling materials; and PPE and miscellaneous materials from sampling, decontamination, and removal activities. These wastes are planned to be disposed of in the ICDF.

Aqueous waste may be generated during decontamination activities or from residuals in piping as it is being removed. If generated, this aqueous waste will be transferred, using the existing piping, to the PEW system for treatment, subject to meeting the WAC. If the PEW system is unable to accept this waste, it will be disposed of at the ICDF evaporation pond if it meets the ICDF WAC (DOE-ID 2003). If it does not meet the ICDF WAC, an alternate treatment and disposal facility will be determined. If liquids need to be collected and containerized for management, containers and secondary containment, if required, will be provided that are compatible with the waste.

3.3.6 Mixed Low-Level Waste from HWMA/RCRA-Regulated System

This project will generate waste piping debris ancillary to a HWMA/RCRA-regulated system that is a MLLW. This waste may include pipes and valves and other process solution lines identified during demolition associated with the PEW drain system. This waste stream will be managed as a unique waste stream since this waste is ancillary to a HWMA/RCRA-regulated system. This debris will be containerized and, as necessary, stored at an INEEL HWMA/RCRA storage unit until transferred to an off-Site RCRA treatment, storage, and disposal facility (TSDF) for treatment and disposal.

3.3.7 Alpha Low-Level Waste

This is waste that contains >10 nCi/g but <100 nCi/g of transuranic isotopes. Waste categorized as alpha low-level waste may include, but is not limited to, sampling materials; metal I-beams and pipe; hot cell windows; glove bags; equipment that cannot be decontaminated; PPE and miscellaneous materials from sampling, decontamination, and removal activities; and other radiologically contaminated materials such as petroleum-contaminated media (i.e., soil or other absorbent materials containing radiological- and petroleum-contaminated materials). This waste will be containerized, treated, and/or managed at the ICDF as necessary until appropriate off-Site management and disposal are arranged.

3.3.8 Mixed Alpha Low-Level Waste

This is waste that contains >10 nCi/g but <100 nCi/g of transuranic isotopes and RCRA hazardous components. Waste categorized as mixed alpha low-level waste may include, but is not limited to, sampling materials; metal I-beams and pipe; hot cell windows; glove bags; equipment that cannot be decontaminated; PPE and miscellaneous materials from sampling, decontamination, and removal activities; and other radiologically contaminated materials such as petroleum-contaminated media

(i.e., soil or other absorbent materials containing radiological- and petroleum-contaminated materials). This waste will be containerized, treated, and/or managed at the ICDF as necessary until appropriate off-Site management and disposal are arranged.

3.3.9 Transuranic Waste

This waste stream contains transuranic isotopes exceeding 100 nCi/g. Examples of material that may be a TRU include debris such as beams, piping, hot cell windows, glove bags, and PPE. In the event waste is generated, it will be containerized and managed at the ICDF as necessary until it can be shipped to a treatment or disposal facility. If the final waste form is determined to be TRU, the waste will undergo treatment, as necessary, and disposal at an off-Site disposal facility such as the Waste Isolation Pilot Plant, subject to WAC compliance.

3.3.10 Mixed TRU Waste

This is waste that contains both transuranic isotopes exceeding 100 nCi/g and RCRA hazardous components. Waste categorized as mixed waste may include, but is not limited to, sampling materials; metal I-beams and pipe; hot cell windows; glove bags; any equipment that cannot be decontaminated; PPE and miscellaneous materials from sampling, decontamination, and removal activities; and other radiologically contaminated materials such as petroleum-contaminated media (i.e., soil or other absorbent materials containing radiological- and petroleum-contaminated materials). If the final waste form is determined to be TRU, the waste will undergo treatment, as necessary, and disposal at an off-Site disposal facility such as the Waste Isolation Pilot Plant, subject to WAC compliance.

3.3.11 Waste Transported to Off-Site Facilities

Waste associated with HWMA/RCRA-regulated systems such as piping will be disposed of at non-INEEL facilities. In addition, hazardous, mixed, or PCB waste that does not meet the ICDF WAC would be sent to a TSDF located outside INEEL boundaries in accordance with the requirements of the U.S. Department of Transportation, the receiving facility's WAC, and the Off-Site Rule (40 CFR 300.440) requirements.

3.3.12 Waste to be Stored Pending Disposal

Though not expected to be encountered, waste generated during the CPP-627 removal action that has uncertainties associated with waste classification (i.e., whether the waste may be high-level waste), such waste will be appropriately staged/stored until appropriate waste classification determinations are made under appropriate criteria. Though not expected to be encountered, waste generated during the CPP-627 removal action that is classified as a high-level waste (e.g., if a sample vial of calcine is found), this waste will be identified as a high-level waste and managed accordingly.

4. WASTE CONTAINER LABELING AND INSPECTION

Containers with waste that is contaminated with hazardous, PCB, radiological, or mixed waste will be labeled with CERCLA waste labels. When containers are full or ready to be transferred for staging, storage, or disposal, the information on the label will be completed. Any additional labeling needed to facilitate management (e.g., Integrated Waste Tracking System barcodes), needed for transport, or required by the receiving facility will be added prior to transport. Any information not known when waste containers are initially labeled will be added when the information is known. Waste labels must be visible, legibly printed or stenciled, and placed on the container in such a manner that a full set of labels and markings is visible for inspection. Figure 4-1 provides an example CERCLA waste label. These descriptions shall have the following information:

- Known Environmental Protection Agency waste codes
- Date generated (filled)
- Waste description (include contaminants of concern, if known)
- Name and phone number of the generator point of contact.

<p style="text-align: center;">CERCLA WASTE</p> <p>Waste Code(s): _____</p> <p>Date Generated: _____</p> <p><u>Waste Description: (e.g., liquid, solid, debris, PPE, etc.):</u></p> <p>_____</p> <p>Point of Contact: _____</p>
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Figure 4-1. Example of a CERCLA waste label.

The MLLW generated from the HWMA/RCRA-regulated system is a unique waste stream that will be managed at a RCRA TSDF. The labels on these containers will have a notation on the CERCLA label's waste description "To be sent to off-Site RCRA TSDF."

4.1.1 Waste Packaging and Transportation

WGS and Packaging & Transportation organization personnel will be consulted prior to generation of waste to identify the specific types of containers in each category that should be used for the anticipated waste. Before contaminated CERCLA waste is transported to a disposal facility, WGS will be consulted to ensure the waste is properly handled, packaged, labeled, and transported appropriately for the receiving facility.

Containers, if used for waste management, will be selected to ensure compatibility with the waste being managed. Wastes that may be managed in containers include soils and debris such as equipment and piping. Areas of consideration include ensuring that waste materials are packaged in containers that are in good condition, materials are compatible with the waste stored in them, and void spaces in

containers are reduced as much as possible. The ICDF waste management personnel will be consulted prior to the use of containers other than those specified in the ICDF WAC.

4.1.2 Managing Waste Information

Information pertaining to waste characteristics, waste generation and staging/storage locations, disposition plans, and waste shipments for nonroutine CERCLA IW or contaminated CERCLA waste is maintained in the IWTS electronic database. Material profiles are developed in IWTS (or similar system used by ICDF) to store characterization information that is specific to a particular waste stream. The information in the IWTS material profiles is certified by a WGS waste technical specialist (WTS), who certifies that a hazardous waste determination has been performed and that the information is complete and accurate based on the analytical data or process knowledge used for characterization. An independent review of the information is performed for completeness and accuracy. Finally, the information in the profile is approved by a WGS WTS who authorizes WGS to dispose of the waste in accordance with the disposition path defined in the IWTS material profile. The WGS WTS also verifies that the waste meets the acceptance criteria of the facility or facilities where the waste will be disposed.

WTSs use the information in the IWTS material and container profiles to ensure that CERCLA waste meets the acceptance criteria of the receiving facility. The IWTS also tracks shipments of waste to various areas or facilities using specific IWTS shipping tasks. Receiving locations, including those located outside the boundaries of the INEEL, must approve waste shipments before they are shipped. This approval is not documented in the IWTS database but is maintained in a hard copy file with the waste characterization information.

Not all CERCLA IW is tracked in the IWTS database. An example of IW that is not tracked in the IWTS is routine office waste. This waste is placed into IW receptacles that are labeled with information pertaining to what is permissible to be placed in the receptacles. Some IW is tracked in the IWTS database to ensure that the INEEL Landfill Complex is aware that the waste is being shipped and that it meets the facility's acceptance criteria. An example of IW that would be tracked in the IWTS is color-coded material such as yellow shoe covers. Since yellow shoe covers are typically used for protection against radioactive contamination, a special profile has been prepared for color-coded PPE that has been surveyed and found not to be contaminated with radioactivity or that has been used for training purposes. Another example would be containers that have had all contents removed, and the empty containers are not radiologically contaminated. Container profiles are typically not prepared for IW because the waste is shipped to the facility in reusable receptacles, in bulk shipments, or is noncontainerized.

4.1.3 Managing Waste at the Work Site

At the work site, the need for temporary staging/storage units for CERCLA hazardous or mixed waste is not anticipated based on the availability of the ICDF staging and storage areas. As containers are being filled, they will be kept within the work area. When the containers have been filled, or no additional waste for that waste stream will be generated, the container labels will be completed and the containers will be transferred to the respective staging, storage, or disposal facility within 10 working days. If, due to unforeseen circumstances, this timeframe cannot be met, INTEC Subproject 6 management will be notified of the circumstance and the timeframe for moving the waste to the ICDF.

5. REFERENCES

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